Catalogue no. 75-006-X
ISSN 2291-0840

Insights on Canadian Society

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by Darcy Hango

Release date: December 19, 2016

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^{r} revised
x suppressed to meet the confidentiality requirements of the *Statistics Act*
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F too unreliable to be published
* significantly different from reference category ($p < 0.05$)

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Cyberbullying and cyberstalking among Internet users aged 15 to 29 in Canada

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Overview of the study

Based on data from the 2014 General Social Survey, this article examines the characteristics associated with being a victim of cyberbullying or cyberstalking within the last five years for the population aged 15 to 29. This article also examines the association between cyberbullying and cyberstalking and various indicators of trust, personal behaviour and mental health.

- In 2014, about 17% of the population aged 15 to 29 (representing about 1.1 million people) that accessed the Internet at some point between 2009 and 2014 reported they had experienced cyberbullying or cyberstalking.
- Of those who experienced cyberbullying or cyberstalking, 36% reported that they had experienced cyberbullying but not cyberstalking, 33% reported that they experienced cyberstalking but not cyberbullying, and 31% reported experiencing both.
- Sociodemographic factors associated with cyberbullying and cyberstalking are not necessarily the same. Cyberbullying was more prevalent in younger age groups and within the homosexual/bisexual population, while cyberstalking was more prevalent among the single, never married population and among women.
- Young Canadians with a past experience of victimization were significantly more likely to experience cyberbullying and cyberstalking. For instance, 31% of those who were physically or sexually assaulted before the age of 15 experienced either cyberstalking or cyberbullying, compared with 13% of those who did not report an experience of assault.
- Cyberbullying is associated with the presence of an emotional, psychological or mental health condition, mistrust of people and marijuana use, while cyberstalking is associated with taking measures to protect oneself from crime.

Introduction

Internet use is very high among Canadians. In 2007, a little more than two-thirds of home Internet users accessed the Internet at least once a day, a finding that was about the same as in 2005.[1] More recently, in 2012, 83% of Canadians aged 16 and over accessed the Internet for personal use via their various devices.[2] The proliferation of handheld devices capable of Internet access has continued to rise, while increasingly more adults are accessing the Internet on cell phones and tablets. Almost 60% of Internet users in 2012 accessed the Internet via a handheld device—a figure that almost doubled (from 33%) between 2010 and 2012.[3] Thus, it is evident that the Internet permeates all facets of life—socially, educationally and recreationally.

However, for all the positives that come with this technological necessity, there may be some unintended negative consequences.[4] An issue that has undesirable and potentially far-reaching consequences is Internet victimization—particularly cyberbullying and cyberstalking. Cyberbullying typically consists of electronic messages that are intimidating or threatening

for the recipient. Cyberstalking refers to the repeated use of electronic communication in order to harass or frighten another person.

Being cyberbullied or cyberstalked, just like physical or psychological bullying, can negatively impact one's physical and mental health, educational achievement, as well as trust and relationships with others.[5,6] The risk of negative consequences associated with Internet use, such as being a victim of cyberbullying, increases as the length of time online increases. At the same time, the risk of negative consequences associated with sleep, physical activity and social well-being may also rise with increased Internet exposure among young adults.[7]

This study uses the 2014 General Social Survey on Canadian's Safety (Victimization) to examine the characteristics associated with being a victim of cyberbullying or cyberstalking within the last five years for the young adult population aged 15 to 29. This paper begins by looking at the measurement of cyberbullying and cyberstalking. The characteristics of the victims of cyberbullying/cyberstalking are then identified in descriptive and multivariate analyses. Lastly, the study examines whether cyberbullying/cyberstalking is associated with various indicators of trust and personal behaviour, including mental health, perceptions of social disorder, taking measures to protect oneself from crime, and marijuana use.

Defining cyberbullying/ cyberstalking

Analyses of cyberbullying are affected by the statistical definition of the phenomenon. In previous work using the 2009 GSS, respondents were asked about their experience with cyberbullying, but rather than during the last five years as in the current study, instead they were asked whether they had "ever" experienced it (see *Data sources, methods and definitions*). As a result, comparisons cannot be readily made between earlier work and this study. Nonetheless, individual details that went into the past as well as the current definition of cyberbullying include (1) receiving threatening or aggressive emails or instant messages (either as the sole recipient or as part of a group); (2) being sent or having pictures posted that were embarrassing or made the respondent feel threatened; and (3) having one's identity used to send out or post embarrassing or threatening information.

Unlike past work, cyberstalking is included in this paper. Cyberstalking and cyberbullying measure very similar phenomena but differ slightly in that cyberstalking, unlike cyberbullying, incorporates more explicitly the fear that respondents feel for their safety. More specifically, with respect to cyberstalking, respondents were asked whether, in the last five years, they had been the subject of repeated and unwanted attention that caused them to fear for their safety or the safety of someone they know. Two measures are used to define cyberstalking in the current context: (1) having been sent unwanted messages through email, text, Facebook or any other social media, and (2) having had someone post inappropriate, unwanted or personal information about them or pictures on a social media site.[8]

The phenomenon of cyberbullying/ cyberstalking affects nearly one-fifth of the young adult population in Canada—17% of the population aged 15 to 29 that accessed the Internet at some point between 2009 and 2014 said they had experienced cyberbullying or cyberstalking (Chart 1). Of this 17%, more than one-third (36%) reported that they had been cyberbullied but not cyberstalked, another third (33%) said that they had been cyberstalked but not cyberbullied, and less than one-third (31%) reported that they had experienced both these types of online victimization, suggesting that both are tightly connected.

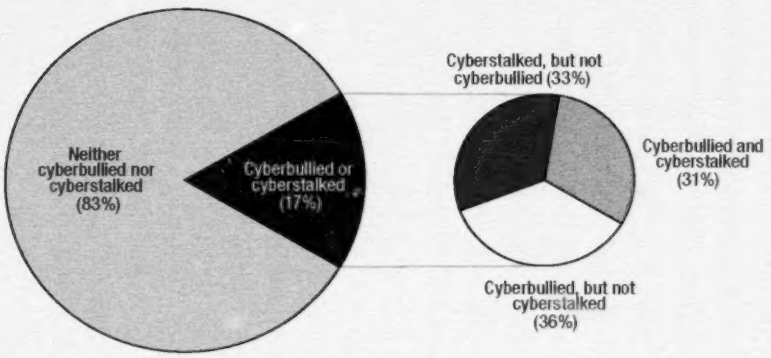
Internet use by age in the last five years

Before examining the relationship between cyberbullying and cyberstalking and various factors in the following sections, the frequency of Internet use among Canadians should be explored as the risk of being cyberbullied or cyberstalked may increase with more frequent Internet use.

According to the 2014 GSS, nearly 100% of the younger Canadian population accessed the Internet in the five years prior to the survey—from 2009 to 2014—a finding in line with prior Canadian literature (Chart 2).[9] For example, the proportion of the Canadian population that accessed the Internet at any point in the last five years does not drop below 90% until the age of 55 to 59, however, even among those aged 65 to 69, almost three-quarters said they accessed the Internet at some point between 2009 and 2014.

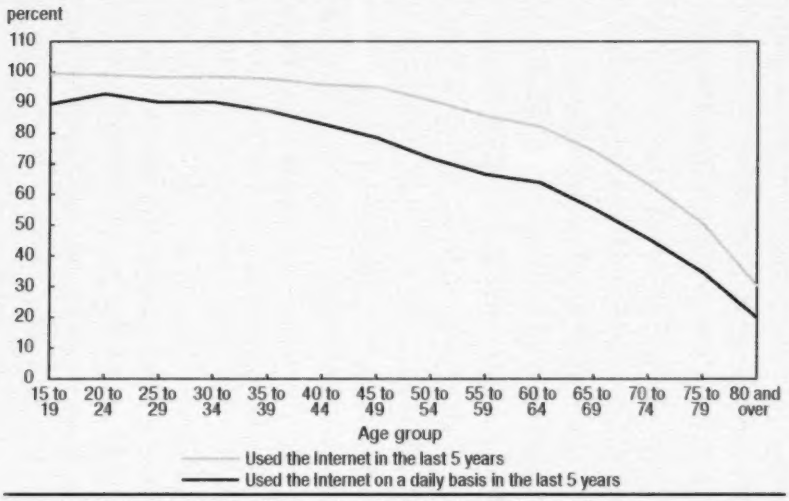
Daily Internet use followed a similar pattern. It is very prevalent at younger ages but then steadily decreases with age. For individuals aged 34 and under, the proportion that goes online on a daily basis is at least 90%, which decreases to around one-half (55%) by age 69.

Chart 1
Percentage of Internet users aged 15 to 29 who were cyberbullied and/or cyberstalked in the last 5 years, 2014


Neither cyberbullied nor cyberstalked (83%)
Cyberbullied or cyberstalked (17%)
Cyberstalked, but not cyberbullied (33%)
Cyberbullied and cyberstalked (31%)
Cyberbullied, but not cyberstalked (36%)

Source: Statistics Canada, General Social Survey on Canadians' Safety (Victimization), 2014.

Chart 2
Internet use by age group, 2014



Source: Statistics Canada, General Social Survey on Canadians' Safety (Victimization), 2014.

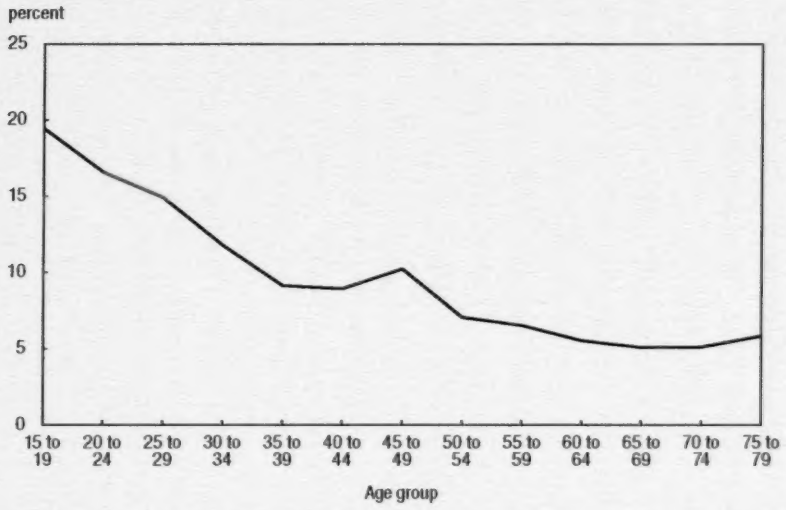
The proportion of Internet users experiencing cyberbullying or cyberstalking in the last five years also declines with age (Chart 3). More particularly, the proportion of Internet users who experienced cyberbullying or cyberstalking was highest among those aged 15 to 19 (19%), progressively declining across older age groups—from 17% for those aged 20 to 24 to around 5% for Internet users over the age of 60. This paper focuses on young people aged 15 to 29 as this is the age group for which Internet use is almost universal—99% of 15-to-29 year-olds used the Internet at some point in the last five years, while 91% used it on a daily basis.

Sociodemographic factors associated with cyberbullying/ cyberstalking

Who is more likely to have been the victim of cyberbullying or cyberstalking? Previous studies suggest that young adults, homosexual or bisexual individuals, and the single/never-married population were more at risk of ever having been cyberbullied.[10] However, as stated earlier, comparisons are hampered by differing definitions—this paper uses a definition that asks about the occurrence of cyberbullying in the last five years, while earlier work used a definition that encompassed all cyberbullying events, not just those occurring in the five years prior to the survey.

As previously reported in the literature, the proportion of those who experienced online victimization is greater for the homosexual and bisexual population (Table 1). In this particular group, more than one-third (34%) reported that they had experienced cyberbullying, cyberstalking, or both, compared with 15% of the heterosexual population. The young adult homosexual and bisexual Internet user population was particularly more likely than their heterosexual counterparts to have experienced cyberbullying (12% versus 5%) and to have experienced both phenomena (12% versus 5%).[11]

Chart 3
Proportion of Internet users who were cyberbullied or cyberstalked in the last 5 years, by age group, 2014



Source: Statistics Canada, General Social Survey on Canadians' Safety (Victimization), 2014.

Young women were particularly more at risk of cyberstalking than young men. In 2014, 7% of young women reported that they had been cyberstalked, versus 5% of young men. Similarly, the single/never-married population was also more at risk of being a victim of cyberstalking (6%) compared with 4% for those who had ever been (or were currently) married or living common-law. Young women and the single/never-married were, like the homosexual/bisexual population, also more likely to have experienced both cyberbullying and cyberstalking in the last five years.

As mentioned earlier, Internet victimization is more prevalent in younger age groups. Among those aged 15 to 20, about 1 in 5 experienced cyberstalking or cyberbullying or both, compared with about 15% of 27- to 29-year-olds. The age differences were more pronounced for cyberbuliying than they were for cyberstalking.

There was little variation between cyberbullying and cyberstalking categories across other sociodemographic, family-related, socioeconomic or cultural/ethnic factors, with the exception of household income. In 2014, about one-quarter of those whose household income was less than $40,000 reported that they had been cyberstalked or cyberbullied, or both. A fairly strong relationship is found for household income and the proportion that was cyberstalked: 11% of individuals from households that earn less than $40,000 said they were a victim of cyberstalking in the last five years, compared with about 5% for all other higher-income groups.[12]

Past experiences of victimization are correlated with cyberbullying/cyberstalking

Past experience of assault (physical or sexual), discrimination or the witnessing of violence involving at least one parent has a significant impact on the likelihood of being cyberstalked or cyberbullied, which is in line with previous research that also found a significant association between victimization or abuse in childhood and a higher risk of victimization in adulthood.[13]

Note, however, that it is difficult to disentangle the ordering of events given the cross-sectional nature of these data. The links discussed below must therefore be interpreted as associations rather than as cause-and-effect relationships.

Among young adults who witnessed violence involving at least one parent, for example, slightly more than one-third experienced cyberbullying, cyberstalking, or both, compared with 15% of those who did not observe any violence involving their parents before the age of 15 (Chart 4). Similarly, cyberbullying and/or cyberstalking was more frequent among those who experienced a physical or sexual assault before the age of 15 (31% versus 13% for those who did not experience assault); and among those who said they had been a victim of discrimination in the last five years (37% versus 12% for those who did not).

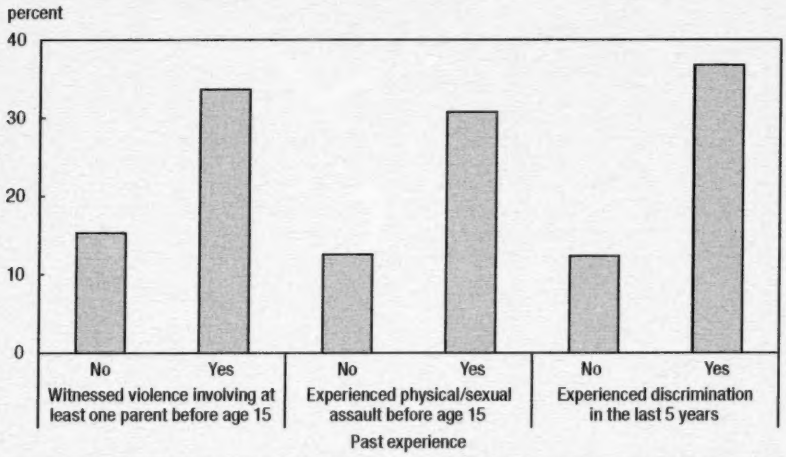
The significance of these results also extended to cyberbullying and cyberstalking when taken independently. For example, 9% of those who had ever witnessed violence involving at least one of their parents when they were

Table 1
Proportion of Internet users aged 15 to 29 who were cyberbullied and/or cyberstalked in the last 5 years,[1] by various characteristics, 2014

	Neither cyberbullied nor cyberstalked	Cyberbullied, but not cyberstalked	Cyberstalked, but not cyberbullied	Cyberbullied and cyberstalked
		percent		
All 15-to-29 year-olds	**83.2**	**6.0**	**5.6**	**5.2**
Sociodemographic				
Sexual orientation[2]				
Heterosexual (ref.)	84.6	5.0	5.6	4.8
Homosexual/bi-sexual	66.0*	12.2*	9.6	12.3*
Age group				
15 to 17 (ref.)	81.0	9.3	5.0	4.8
18 to 20	80.5	7.8	5.6	6.1
21 to 23	84.0	5.1*	6.1	4.8
24 to 26	84.5	5.0*	5.7	4.8
27 to 29	85.4*	3.5*	5.6	5.5
Gender				
Men (ref.)	85.2	6.1	4.7	4.1
Women	81.1*	6.0	6.6*	6.4*
Province/region of residence				
Atlantic	82.1	6.8	5.2	5.9
Quebec	86.6*	5.9	4.1†	3.4*
Ontario (ref.)	81.0	7.0	6.0	6.1
West	83.7	4.9†	6.2	5.2
Population size of community				
Rural (ref.)	84.0	6.6	3.7	5.8
Population centre	82.9	5.9	6.1*	5.1
Family, family background				
Marital status				
Currently married or ever-married/common-law (ref.)	88.8	4.0	4.1	3.2
Single/never-married	81.7*	6.6*	6.0*	5.7*
Parental education				
Both have high school or less (ref.)	81.1	6.7	7.1	5.1
At least one has postsecondary education	84.6	5.3	5.0	5.0
Both have postsecondary education	82.5	6.2	5.8	5.5
Do not know either parent's education level	84.4	6.0	4.5†	5.1
Education/main activity/household income				
Highest level of education				
Less than high school (ref.)	81.2	9.1	4.5	5.3
High school	81.3	5.7*	7.0*	6.0
Postsecondary - non-university	86.7*	4.4*	5.0	4.0
Postsecondary - university	84.3	5.2*	5.2	5.3
Main activity in the last year				
Non-student (ref.)	84.5	4.9	5.6	4.9
Student	81.7†	7.2*	5.6	5.5
Household income (before tax)				
Less than $40,000 (ref.)	75.6	6.3	11.1	7.1
$40,000 to $79,999	83.4*	7.1	5.2*	4.3
$80,000 or more	85.3*	5.0	5.1*	4.6
Not stated	82.6*	6.3	5.4*	5.6
Cultural/ethnic				
Religious affiliation				
None (ref.)	80.6	6.2	6.0	7.2
Christian	84.4*	6.3	5.2	4.2*
Non-Christian	83.8	4.2	7.4	4.6
Visible minority				
No (ref.)	82.2	6.5	5.6	5.8
Yes	86.1*	4.8	5.4	3.7*

* significantly different from reference category (ref.) ($p < 0.05$)
† significantly different from reference category (ref.) ($p < 0.10$)
1. Restricted to only those who had used the Internet at some point in the last 5 years.
2. Sexual orientation was only asked of respondents aged 18 and over.
Source: Statistics Canada, General Social Survey on Canadians' Safety (Victimization), 2014.

Chart 4
Proportion of Internet users aged 15 to 29 who were cyberbullied, cyberstalked or both in the last 5 years, by past experience of assault, discrimination or witnessing violence involving at least one parent, 2014



Note: Restricted to only those who had used the Internet at some point in the last 5 years. All "Yes" answers are significantly different from the reference category (No) at $p < 0.05$.
Source: Statistics Canada, General Social Survey on Canadians' Safety (Victimization), 2014.

under the age of 15 had been a victim of cyberstalking, 10% had been a victim of cyberbullying and 14% experienced both. In all three cases, the percentage was about 5% among those who had never witnessed violence involving at least one parent (Table 2).

Similarly, experiencing physical/sexual assault prior to the age of 15 also correlated with an increased probability of being cyberbullied and/or cyberstalked. For example, the proportions were all at 10% or above for cyberstalking, cyberbullying, or both among those who experienced an assault in childhood, compared with 5% or less among those who had not experienced these prior assaults. A slightly larger effect was found for individuals who had been a victim of discrimination in the last five years—they were especially more likely to report that they had experienced both phenomena (14%, compared with 3% among those who did not experience discrimination).

It is nevertheless important to examine the relationship between the events while, at the same time, taking all these factors into account in a model (based on a multinomial logistic regression). The dependent variable cyberbullying/cyberstalking consisted of the following four categories: (1) neither happened; (2) cyberbullying but not cyberstalking happened; (3) cyberstalking but not cyberbullying happened; and (4) both cyberstalking and cyberbullying happened. What these multivariate results show (see Table A1) is that all else being equal, the factors related to past experience of assault (physical or sexual), discrimination or the witnessing of violence involving at least one of their parents continue

Table 2
Proportion of Internet users aged 15 to 29 who were cyberbullied and/or cyberstalked in the last 5 years,[1] by past experience of assault, discrimination or witnessing violence involving at least one parent, 2014

	Neither cyberbullied nor cyberstalked	Cyberbullied, but not cyberstalked	Cyberstalked, but not cyberbullied	Cyberbullied and cyberstalked
		percent		
Witnessed violence involving at least one parent before age 15				
No (ref.)	84.7	5.7	5.3	4.4
Yes	66.4*	10.1*	9.1*	14.4*
Experienced physical/sexual assault before age 15				
No (ref.)	87.4	4.8	4.4	3.4
Yes	69.2*	10.1*	9.7*	10.9*
Experienced discrimination in the last 5 years				
No (ref.)	87.7	4.7	4.3	3.3
Yes	63.2*	11.9*	11.3*	13.6*

* significantly different from reference category (ref.) ($p < 0.05$)
1. Restricted to only those who had used the Internet at some point in the last 5 years.
Source: Statistics Canada, General Social Survey on Canadians' Safety (Victimization), 2014.

to have a significant impact on the probability of cyberstalking and/or cyberbullying.

The results also confirmed that women, the single/never-married population, as well as those from households with incomes of less than $40,000 remained more likely to be cyberstalked, even after taking other factors into account. The youngest population (aged 15 to 20) also remained more likely to be cyberbullied than those aged 24 to 29.[14]

Relationship between cyberbullying/cyberstalking and various indicators of trust, personal behaviour and mental health

Previous work has revealed a negative association between being cyberbullied and serious mental health issues[15] and lack of trust in family members.[16] Other personal attitudes related to cyberbullying and cyberstalking may include a greater mistrust of neighbours, a greater perception of social disorder in one's neighbourhood, as well as drug use or taking measures to protect oneself. The latter is not necessarily a negative event, but one that can be an indicator of a person fearing for their safety.

Given the cross-sectional nature of the data, however, it is important not to interpret these indicators as consequences of cyberbullying/cyberstalking. As a result, this paper is assessing the strength of the relationship between a number of behavioural indicators and cyberbullying/cyberstalking, not causal relationships.

This section examines the relationship between cyberbullying/cyberstalking and the following personal situations: (1) presence of an emotional, psychological or mental health condition;[17] (2) perceived social disorder in the neighbourhood;[18] (3) mistrust of people in the neighbourhood;[19] (4) mistrust of people from work or school;[20] (5) taking measures to protect oneself from crime;[21] and (6) use of marijuana, hashish, hash oil or other cannabis in the last month.

Across all 15-to-29 year-old Internet users, 17% said they had an emotional, psychological or mental health condition; 8% said they perceived social disorder in their neighbourhood; and 45% and 30% had a low level of trust in their neighbours or in people from work or school, respectively. Meanwhile, 17% had taken measures in the last year to protect themselves from crime, and 15% had used marijuana at some point in the last month.

Cyberbullying and/or cyberstalking is associated with an increased probability of experiencing each of the six indicators measured (Table 3). Cyberstalking was particularly associated with a perception of social disorder in the neighbourhood (14%, compared with 7% for those who did not experience cyberstalking or cyberbullying). Marijuana use, meanwhile, was higher among those who had experienced cyberbullying (28%, compared with 13% for those who had not experienced cyberbullying or cyberstalking).

The combined effect of cyberstalking and cyberbullying raised the risk of experiencing the situations listed above—particularly the presence of an emotional, psychological or mental health condition, and a low level of trust in people from work and school. For example, 26% of individuals who were cyberstalked said they had an emotional, psychological or mental health condition. That probability rose to 33% for those who were cyberbullied and 41% for those who experienced both. Similar findings were found for both measures of trust.

Once a wide range of sociodemographic, familial and other background variables are taken into account, the association between cyberbullying/cyberstalking and the six indicators of trust and personal behaviour decreases. However, a significant association still remains in many instances, most notably—in the event of cyberbullying—on mental health, mistrust of neighbours and people from work and school, and marijuana use; and—in the event of cyberstalking—on taking measures to protect oneself from crime.

The fact that this latter association remains relevant even after controlling for a wide range of factors is important as it shows a potentially direct impact that cyberstalking may have on one's behaviour. That is to say if an individual was a victim of cyberstalking in the last five years, they had an 8 percentage point higher probability of taking measures in the last year to protect themselves, compared with individuals who had not been cyberstalked or cyberbullied, all else being equal.

Furthermore, the impact that both events have on the presence of an emotional, psychological or mental health condition should also be highlighted. All else being equal, if a respondent had been a victim of cyberstalking and cyberbullying in the last five years, their probability of stating that they have a mental health condition rose to 26%—13 percentage points higher than if they had not been a victim of these events.

Table 3
Indicators of trust, personal behaviour and mental health among Internet users aged 15 to 29, by cyberbullying and/or cyberstalking experience, 2014

	Indicator					
	Presence of an emotional, psychological or mental health condition	Perceived social disorder in their neighbourhood	Low level of trust in people in their neighbourhood	Low level of trust in people from work or school	Took measures to protect oneself from crime in the last year	Marijuana use in the last month
	percentage					
All 15-to-29 year-old Internet users	**16.8**	**7.8**	**44.9**	**30.0**	**16.7**	**15.0**
	predicted probabilities[1]					
Bivariate model						
Neither cyberbullied nor cyberstalked (ref.)	13.8	6.8	42.5	27.9	15.2	13.0
Cyberbullied but not cyberstalked	32.8*	10.6	59.9*	43.7*	23.9*	28.2*
Cyberstalked but not cyberbullied	26.4*	13.9*	55.2*	35.2†	26.2*	17.9
Cyberbullied and cyberstalked	41.3*	13.9*	53.4*	44.1*	21.6†	30.7*
Adjusted model[2]						
Neither cyberbullied nor cyberstalked (ref.)	12.5	5.9	42.8	27.4	14.5	10.5
Cyberbullied but not cyberstalked	24.2*	8.3	60.4*	37.9*	21.1†	22.2*
Cyberstalked but not cyberbullied	16.9	9.8†	50.3	31.4	22.3*	13.3
Cyberbullied and cyberstalked	25.6*	9.4	47.5	39.0*	17.7	21.9*

* significantly different from reference category (ref.) ($p < 0.05$)

† significantly different from reference category (ref.) ($p < 0.10$)

1. These are predicted probabilities based on marginal effects at the mean derived from logistic regressions.

2. The control variables are age; sex; country of birth; province of residence; length of time lived in neighbourhood; population size of community; marital status; presence of children; education level of parents; parents' country of birth; respondent's highest level of education; main activity in the last year; household income; religious affiliation and frequency of participation; visible minority; aboriginal self-identification status; mother tongue; witnessed violence involving at least one parent before the age of 15; experienced physical/sexual assault before the age of 15; and discrimination in the last 5 years.

Source: Statistics Canada, General Social Survey on Canadians' Safety (Victimization), 2014.

The set of variables with the greatest impact on the relationship between cyberstalking and cyberbullying and the six situations discussed above are those related to exposure to past stressful experiences—namely experiencing a physical or sexual assault prior to the age of 15, witnessing violence involving at least one of their parents prior to the age of 15, and experiencing recent discrimination in the last five years. The importance of these factors, especially with respect to the presence of an emotional, psychological or mental health condition can be observed for respondents who had experienced both cyberstalking and cyberbullying.

For example, in the bivariate model, respondents who were victims of both cyberstalking and cyberbullying had a 28 percentage point higher probability of having a mental health condition than those who experienced neither of these events. In the adjusted model, it was observed that this percentage point difference, while still significant, had dropped to 13 percentage points, in good part because of the strong correlation between cyberstalking/cyberbullying and the three past experience variables listed above.[22] This suggests that negative behavioural and psychological outcomes are often the result of a combination of factors.

Accumulation of negative life events

The results discussed above, especially those with respect to the presence of an emotional, psychological or mental health condition, are indicative of the impact that cumulative stressful or negative life events may have on psychological well-being. A great deal of past work suggests that stress and its harmful consequences can accumulate over one's life.[23]

In the context of this study, the additive impact of three stressors at different points in an individual's life are combined in order to examine if there are any lingering psychological effects, namely (1) whether they experienced physical or sexual assault before the age of 15; (2) whether they had experienced discrimination in the five years prior to the survey; and (3) whether they had been a victim of cyberbullying/cyberstalking in the five years prior to the survey.[24] Each are harmful in their own right, but, when they all have occurred in a person's life, the additive impact may be especially detrimental.

In this section, the impact of these three events on the presence of an emotional, psychological or mental health condition is examined. Results from the previous section have shown that 17% of the sample of 15-to-29 year-old Internet users said they had such a condition. Each one of the three potentially detrimental events has an independent effect on mental health, since each on its own raises the probability of having an emotional, psychological or mental health condition—from about 7 percentage points for childhood physical or sexual assault (raising the probability from 11% to 18%) to about 9 percentage points for the two other events (raising the probability to around 20%).

Yet once the combination of these events is examined, the negative impact on mental health increases substantially—to 38% when cyberbullying/cyberstalking and childhood assault occurred; to 38% when discrimination and cyberbullying/cyberstalking occurred; and to 40% when childhood assault was combined with discrimination (Table 4). However, the largest effect by far is noted for individuals when all three events had happened. For these young adults, the probability of having a self-reported emotional, psychological or mental health condition was 47%, or 36 percentage points higher than those who had experienced none of these events.

The cumulative impact of these three stressors on mental health is fairly robust because even in the adjusted model when a wide range of control variables are taken into account, the difference remains statistically significant when any one of them occurred. The percentage point difference compared with those who experienced none of the events ranges from 8[25] for those who experienced childhood assault but not the other two stressors, to 33[26] for those who experienced all three stressors.

What is implied by such results is that cyberbullying/cyberstalking on its own is positively correlated with having a mental health condition, but it is the combination with other negative stressors that is especially detrimental. This finding is important because it suggests that these individuals may need a higher degree of assistance in order to cope with the negative consequences of cyberbullying and cyberstalking.

Conclusion

Internet use is almost universal for the young adult population in Canada—almost 100% have used the Internet at some point between 2009 and 2014, while over 90% have used it on a daily basis during this same time period. Despite all the benefits of going online (i.e., social, educational and commercial) there may be some risks. Approximately 1.1 million (or about 17%) of all 15-to-29 year-old Internet users experienced either cyberbullying or cyberstalking between 2009 and 2014.

This paper sheds light on the risk factors associated with recent cyberbullying and cyberstalking. It reveals that the risk factors for cyberbullying and cyberstalking are not exactly the same: the homosexual and bisexual population (compared with the heterosexual population) as well as individuals in the youngest age groups are more at risk of being victims of cyberbullying. Meanwhile, young women, the single/never-married population, and those who live in households at the lower end of the income distribution are more at risk of being cyberstalked than their male, ever-married, and higher-income counterparts. These relationships are fairly robust as they are not removed in multivariate models controlling on a wide range of factors. The most important factors associated with a higher probability of being cyberstalked or cyberbullied, however, are related to witnessing violence involving at least one of their parents or being

Table 4
Cumulative stressors and presence of an emotional, psychological or mental health condition, Internet users aged 15 to 29, 2014

	Bivariate model	Adjusted model[1]
	predicted probabilities[2]	
None occurred (ref.)	10.5	9.4
(1) Cyberbullying/cyberstalking in the last 5 years	20.8*	17.7*
(2) Experienced physical/sexual assault before age 15	18.0*	17.0*
(3) Experienced discrimination in the last 5 years	19.8*	17.5*
(1) and (2)	38.1*	32.3*
(1) and (3)	37.9*	33.5*
(2) and (3)	39.5*	35.5*
(1), (2) and (3)	46.8*	42.4*

* significantly different from reference category (ref.) ($p < 0.05$)

1. The control variables are age; sex; country of birth; province of residence; length of time lived in the neighbourhood; population size of community; marital status; presence of children; education level of parents; parents' country of birth; respondent's highest level of education; main activity in the last year; household income; religious affiliation and frequency of participation; visible minority; Aboriginal self-identification; and mother tongue.

2. These are predicted probabilities based on marginal effects at the mean derived from logistic regressions.

Source: Statistics Canada, General Social Survey on Canadians' Safety (Victimization), 2014.

a victim of physical or sexual assault prior to the age of 15 as well as being a victim of recent (in the last five years) discrimination. These factors are each independently associated with a higher probability of online victimization and remain significant in models that consider a wide range of factors.

This analysis shows that, all else being equal, cyberbullying and cyberstalking are related to an individual's mental health, level of trust and personal behaviour. Adjusted models revealed that cyberbullying on its own raised the probability of (1) having an emotional, psychological or mental health condition; (2) having a low level of trust in people in the neighbourhood, at school and at work; and (3) recent use of marijuana. On the other hand, cyberstalking on its own appears to be more associated with taking recent measures to protect oneself from crime. When both cyberbullying and cyberstalking occur, the probability of having a mental health condition as well as having a low level of trust in people from work and school are especially high.

Lastly, this paper reveals that victimization from cyberstalking and/or cyberbullying has a negative effect on mental health, not unlike the negative association similar to other stressors. On their own, cyberstalking and cyberbullying are detrimental to mental health, however, when combined with stressors from earlier in life (such as experiencing physical and sexual assault prior to the age of 15) or more recently (such as experiencing discrimination in the last five years), the probability of having a mental health condition increases significantly. Hence, almost 20% of Internet users aged 15 to 29 who had been recently cyberbullied or cyberstalked said that they currently had an emotional, psychological or mental health condition; however, for those cyberbullying or cyberstalking victims who were also recently discriminated against, and who had also experienced physical or sexual assault prior to the age of 15, the probability of having a mental health condition more than doubles.

The benefits of the Internet for the young adult population are numerous, however, as this study has illustrated, there are certain risks associated with the anonymity and widespread exposure to many unknown factors while online. Some groups are at greater risk of online victimization in the form of cyberstalking or cyberbullying than others, and future work should continue to better understand the issues faced by this vulnerable population.

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Data sources, methods and definitions

Data sources

This report uses data from the 2014 General Social Survey on Canadian's Safety (Victimization). The target population consisted of the non-institutionalized Canadian population aged 15 and over, living in the 10 provinces. The data were collected throughout the 2014 calendar year. Responding to the survey is voluntary and the data are collected directly from the survey respondents (self-declared). The 2014 Victimization Survey had a final sample size of 33,127 and a 52.9% response rate.

Table 5 describes the cyberbullying and cyberstalking measures used in this analysis. Although cyberbullying and cyberstalking have not been examined simultaneously in previous studies, this study combines the two as sources of Internet victimization given their relatively close association. This study used seven questions to measure this phenomenon—five for cyberbullying and two for cyberstalking. The five cyberbullying measures were only asked of those who said they had used the Internet at some point in the last five years, while the two cyberstalking measures did not have this restriction. However, for better comparability across all seven measures, the sample was restricted to Internet users regardless of the questions that were asked.

Nearly 20% of 15-to-29 year-old Internet users said they had experienced any one of the seven measures: the most common measure, at 10%, concerns whether they felt fear as a result of receiving unwanted messages via email, text, Facebook or other social media—an indicator of cyberstalking. The next most common measure, at about 7%, is with respect to individuals saying they have received threatening or aggressive emails or instant messages where they were the only recipient—an indicator of cyberbullying. The prominence of these two variables is also apparent when only the population of young adult Internet users who responded "yes" to any of the seven measures is examined: 58% of them said they feared for their safety because of unwanted messages on social media, while 39% said they had received threatening or aggressive messages via social media where they were the only intended recipient. These latter estimates based on the population that said they had been cyberbullied/cyberstalked do not add to 100 as respondents may have responded "yes" to more than one measure—in fact, about 40% said they had experienced more than 1 in 7 in the last five years.

Data sources, methods and definitions (concluded)

Table 5
Individual elements of the cyberbullied/cyberstalked definition, 2014[1]

	All Internet users[2]	Among Internet users who had been cyberbullied/ cyberstalked[3]
	percent	
Cyberbullying/cyberstalking individual variables		
Respondent said "yes" to any one of the 7 items below:	16.7	...
In the past 5 years...		
1. Cyberbullying: Have you ever received threatening or aggressive emails or instant messages where you were the only recipient?	6.5	39.0
2. Cyberbullying: Have you ever been the target of threatening or aggressive comments spread through group emails, instant messages or postings on Internet sites?	4.8	28.7
3. Cyberbullying: Has anyone ever sent out or posted pictures that embarrassed you or made you feel threatened?	2.2	12.9
4. Cyberbullying: Has anyone ever used your identity to send out or post embarrassing or threatening information?	1.4	8.6
5. Cyberbullying: Have you ever been the target of any other kind of cyberstalking/bullying (which is the use of the Internet to embarrass, intimidate or threaten someone) not already mentioned?	0.4	2.6
In the past 5 years, have you been the subject of repeated and unwanted attention that caused you to fear for your safety or the safety of someone known to you? By that I mean...		
6. Stalking (communication): Has anyone sent you unwanted messages through email, text, Facebook or any other social media?	9.7	57.8
7. Stalking (threat): Has anyone posted inappropriate, unwanted or personal information about you or pictures on a social media site?	2.2	12.9

... not applicable

1. Population aged 15 to 29.
2. Internet users are defined as those who said they had used the Internet at some point in the last 5 years.
3. Numbers do not add up to 100 because these 7 items are not mutually exclusive and respondents could have responded "yes" to more than one item.

Source: Statistics Canada, General Social Survey on Canadians' Safety (Victimization), 2014.

Supplementary information

Table A1
Predicted probability of Internet users aged 15 to 29 being cyberbullied or cyberstalked in the last 5 years,[1] by various characteristics, 2014

	Not cyberbullied or cyberstalked	Cyberbullied, but not cyberstalked	Cyberstalked, but not cyberbullied	Cyberbullied and cyberstalked
		percent		
Across all 15 to 29 year old Internet users	**87.2**	**4.9**	**4.5**	**3.4**
Sociodemographic characteristics				
Age				
15 to 17 (ref.)	84.0	8.3	5.8	2.0
18 to 20	83.2	8.6	4.2	4.0[†]
21 to 23	89.5	4.1	3.8	2.6
24 to 26	88.5	3.6[†]	4.4	3.5
27 to 29	87.3	2.8[†]	4.7	5.2
Gender				
Men (ref.)	88.5	5.0	3.7	2.8
Women	85.6*	4.8	5.6*	4.0[†]
Province/region of residence				
Atlantic	86.5	5.2	4.4	3.9
Quebec	88.7	4.2	4.2	2.9
Ontario (ref.)	85.1	6.2	4.9	3.8
West	88.5*	4.0*	4.4	3.1
Population size of community				
Rural (ref.)	88.3	4.8	2.9	4.0
Population centre	86.8	4.9	5.1*	3.2
Family, family background				
Marital status				
Currently married or ever-married/common-law (ref.)	92.7	3.3	2.7	1.3
Single/never-married	85.3*	5.3[†]	5.1*	4.3*
Parental education				
Both have high school or less (ref.)	84.5	5.9	6.2	3.4
At least one has postsecondary education	88.3[†]	4.4	4.0	3.2
Both have postsecondary education	86.8	5.1	4.6	3.5
Do not know either parent's education level	89.6*	4.0	3.4*	3.0
Education/main activity/household income				
Highest level of education				
Less than high school (ref.)	87.4	5.6	2.9	4.1
High school	87.1	4.0	5.6[†]	3.2
Postsecondary - non-university	88.0	4.4	4.9	2.7
Postsecondary - university	85.1	6.7	4.6	3.6
Main activity in the last year				
Non-student (ref.)	87.8	4.9	4.4	2.8
Student	86.5	4.9	4.6	4.0
Household income (before tax)				
Less than $40,000 (ref.)	81.6	5.4	9.4	3.6
$40,000 to $79,999	86.7	5.7	4.8[†]	2.9
$80,000 or more	88.2*	4.3	4.2*	3.2
Not stated	87.1[†]	5.0	4.3*	3.6
Cultural/ethnic				
Religious affiliation				
None (ref.)	86.4	4.8	4.5	4.2
Christian	87.6	5.2	4.3	2.9[†]
Non-Christian	86.7	3.5	6.1	3.7
Visible minority				
No (ref.)	85.8	5.4	4.9	3.9
Yes	91.0*	3.5	3.6	2.0*

Table A1
Predicted probability of Internet users aged 15 to 29 being cyberbullied or cyberstalked in the last 5 years,[1] by various characteristics, 2014 (concluded)

	Not cyberbullied or cyberstalked	Cyberbullied, but not cyberstalked	Cyberstalked, but not cyberbullied	Cyberbullied and cyberstalked
	percent			
Past experience of assault, discrimination or witnessing violence involving at least one parent				
Witnessed violence involving at least one parent before age 15				
No (ref.)	87.7	4.7	4.4	3.1
Yes	79.7*	7.5	5.6	7.2*
Experienced physical/sexual assault before age 15				
No (ref.)	89.4	4.1	3.8	2.7
Yes	77.4*	8.2*	7.6*	6.8*
Experienced discrimination in the last 5 years				
No (ref.)	89.6	4.0	3.8	2.6
Yes	71.2*	11.0*	8.7*	9.0*

* significantly different from reference category (ref.) ($p < 0.05$)

† significantly different from reference category (ref.) ($p < 0.10$)

1. Restricted to only those who had used the Internet at some point in the last 5 years.

Note: Average marginal predicted probabilities are based on multinomial logistic regressions. The multinomial logistic regression model also includes country of birth of respondent and parents; length of time lived in their neighbourhood; presence of children; frequency of participation in religious activities; Aboriginal self-identification; and mother tongue.

Source: Statistics Canada, General Social Survey on Canadians' Safety (Victimization), 2014.

Notes

1. See Middleton et al. (2010).
2. See Statistics Canada (2013).
3. See Statistics Canada (2013).
4. See Avvisati (2016); Ahn (2011), Schurgin O'Keeffe et al. (2011); Steers et al. (2014).
5. See Cowie (2013); Nixon (2014); Perreault (2011); Slonje et al. (2013).
6. There is debate about terminology in the literature—some use cyber aggression, while others use cyberbullying. There is also no consensus on whether cyberbullying and cyberstalking are similar phenomena with similar consequences. This debate is beyond the scope of this paper, but readers are encouraged to read recent work by Kowalski et al. (2014), and Felmlee and Faris (2016).
7. See Avvisati (2016).
8. A measure that includes both cyberbullying and cyberstalking is useful because, while there is a fairly high degree of overlap between them, they remain distinct concepts, and by separating them it is possible to ascertain which factors are more associated with either of them, or both of them. In all analyses, the sample is restricted to those who had used the Internet at some point in the last five years. The five cyberbullying measures already had this restriction, however, the two cyberstalking measures did not have such a restriction. Table 5 explains the measures used in the current definition in more detail.
9. See Middleton et al. (2010).
10. See Perreault (2011).
11. Note that the sample is restricted to those aged 18 to 29 only for analyses related to sexual orientation—this question was not asked of individuals aged 15 to 17.

12. Previous work (see Perreault, 2011) also found this effect for lower-income individuals for cyberbullying, but not for cyberstalking. Comparisons between this study and that of Perreault (2011) were, however, hampered by definitional differences.

13. See for example Desai et al. (2002); Parks et al. (2011); Perreault (2015); Widom et al. (2008).

14. In an additional model based on the population aged 18 to 29, the sexual orientation variable was added. For the most part, the three victimization measures remained significant, along with other sociodemographic variables. However, when the three victimization measures were taken into account, the difference in the probabilities related to cyberstalking and cyberbullying between the homosexual/bisexual and heterosexual populations was removed.

15. See Cowie (2013); Nixon (2014); Patchin and Hinduja (2010).

16. See Perreault (2011).

17. Respondents stated that they "sometimes," "often" or "always" have an emotional, psychological or mental health condition that may include anxiety, depression, bipolar disorder, substance abuse, anorexia, etc.

18. Respondents were asked to comment on "how big a problem" seven different conditions were in their neighbourhood, including (1) noisy neighbours or loud parties; (2) people hanging around on the streets; (3) garbage or litter lying around; (4) vandalism, graffiti, and other deliberate damage to property of vehicles; (5) people being attacked or harassed because of their skin colour, ethnic origin or religion; (6) people using or dealing drugs; and (7) people being drunk or rowdy in public places. If they reported that at least 3 in 7 were a "moderate" or "big" problem, they are defined as a person who perceives their neighbourhood as having social disorder.

19. Using a scale of 1 to 5, where 1 means "cannot be trusted at all" and 5 means "can be trusted a lot," respondents were asked how much they trust the people in their neighbourhood. Those scoring 1, 2 or 3 were deemed to have a lower level of trust in their neighbours.

20. Using a scale of 1 to 5, where 1 means "cannot be trusted at all" and 5 means "can be trusted a lot," respondents were asked how much they trust the people from their work or school. Those scoring 1, 2 or 3 were deemed to have a lower level of trust in people from work or school.

21. Respondents did at least one of the following in the last year to protect themselves or their property from crime: (1) changed routines or activities, or avoided people or places; (2) installed new locks or security bars; (3) installed burglar alarms, motion detectors or video surveillance; (4) took a self-defence course; (5) obtained a dog; or (6) changed residences or moved.

22. Note that, among these three variables, the witnessing of violence involving at least one of their parents before the age of 15 was not significant once childhood assault and recent discrimination were taken into account.

23. See, in particular, Wheaton and Gotlib (1997); Dich et al. (2015); Nurius et al. (2013); Turner et al. (2006); Ferraro et al. (2016); Schilling et al. (2008).

24. For this analysis, cyberstalking and cyberbullying are combined into a measure that equals 1 if either of these events occurred.

25. $17.0 - 9.4 = 7.6$.

26. $42.4 - 9.4 = 33.0$.

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